GOVERNMENT OF INDIA
SCIENCE AND TECHNOLOGY
LOK SABHA

UNSTARRED QUESTION NO:4047
ANSWERED ON:10.08.2016
Solar Power Tree
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Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

(a) whether the Government has developed "Solar Power Tree", an innovative way to generate electricity by harnessing maximum solar energy in a limited space;
(b) if so, the details thereof and the manner in which the solar energy is used for producing electricity;
(c) whether the Government proposes to introduce it in all Government institutions and if so, the details thereof;
(d) the total solar energy likely to be generated by a solar power tree and the cost involved in its installation along with the number of companies that have been given licence of this technology; and
(e) to what extent this innovation is likely to increase solar power in the country?

Answer

MINISTER OF STATE OF SCIENCE AND TECHNOLOGY AND EARTH SCIENCES

(SHRI Y.S. CHOWDARY)

(a) Yes, Madam. The technology consists of innovative design for mounting solar panels over a single structure, which captures solar energy for downstream utility. The design is registered at The Patent Office, GOI with Design No. 251575 dated 11.02.2013 assigned to Council of Scientific and Industrial Research (CSIR), Rafi Marg, New Delhi-110001.

The salient feature of the Solar Power Tree involves creation of minimal footprint, whereby substantial saving in space can be brought about. In contrast, the normal deployment of solar panels requires significant space.

(b) The structure is decorated with an array of metallic branches holding commercially available Solar Photo Voltaic (SPV) panels. Photovoltaics involve direct conversion of light into electricity. Some materials exhibit the property of absorbing photons and in turn releasing electrons also known as the photoelectric effect. On capture of these free electrons, DC electric current is produced. The generated DC current is converted to AC using solar inverter. For backup at night, battery can be used as per the requirement of the consumer.

For Solar Power Tree developed at CSIR-CMERI, the land space requirement is only 4 sq. ft. for generation of 5 kW electricity. The conventional solar power plant of the same capacity would require 400 Sq. ft. of land. Moreover, the occupied land in conventional solar plant is not reusable for other purposes.

(c) The prototype of solar power tree has been successfully demonstrated in public. As a result, CSIR-CMERI has received a number of queries from different parts of the country for installation of this "make-in-India" technology. An attempt is being made to improve upon the landscape aesthetics of individual institutions using solar tree.

It is expected that with promotional schemes, all Government installations would benefit from the development. This is likely to result in sufficient savings in the utility bills of the institutions.

(d) CSIR-CMERI has developed Solar Power Trees of 1, 2.4, 3 and 5 kW capacities. The cost of solar power tree, including its installation, varies from INR 1-1.5 lakhs per kW depending upon the design of solar tree. For a 5 kW normal design of solar power tree, the cost is INR 5 Lakhs including 3 hrs battery backup, while with improved aesthetic design, its cost would be INR 7.5 Lakhs. M/s. Vibes Solar Solution LLP, Kolkata has been given licence for the technology.

(e) The government is giving major thrust to solar energy utilization. As the Solar Power Tree occupies almost 1% of land surface as compared to conventional solar plants, electricity generation in urban areas, hilly areas, islands like A&N, Lakshadweep etc. will be easier with least foot prints. The major advantage of this innovation is that the land under the tree area can be reused either for car parking, gardening or for other purposes. In rural area, agricultural land can be simultaneously used for solar power generation.
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